NCTCOG PRESENTATION

SMARTER SIGNAL OPERATIONS WITH CONNECTED VEHICLE DATA

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THE POWER OF CONNECTED VEHICLE DATA

- U.S. Signals Scorecard: 500+ regions, all MPOs, counties with 200+ signals.

- Reveals real-time signal performance and trends.

- Provides system-wide insights previously unavailable.

- QR code to explore your region.

Scan to See Your Region Performance Results

THE REGIONAL CONTEXT

The North Central Texas Council of Governments (NCTCOG) serves a 16-county area with a population of about 8.7 million.

The Metropolitan Planning Area (MPA) includes 12 counties. 10 counties are classified as non-attainment for air quality.

The region has a complex traffic signal environment:

- Over 7,000 traffic signals in operation.

- Maintained by 60+ local agencies

LEGEND
- Metropolitan Planning Area
- NCTCOG Boundary
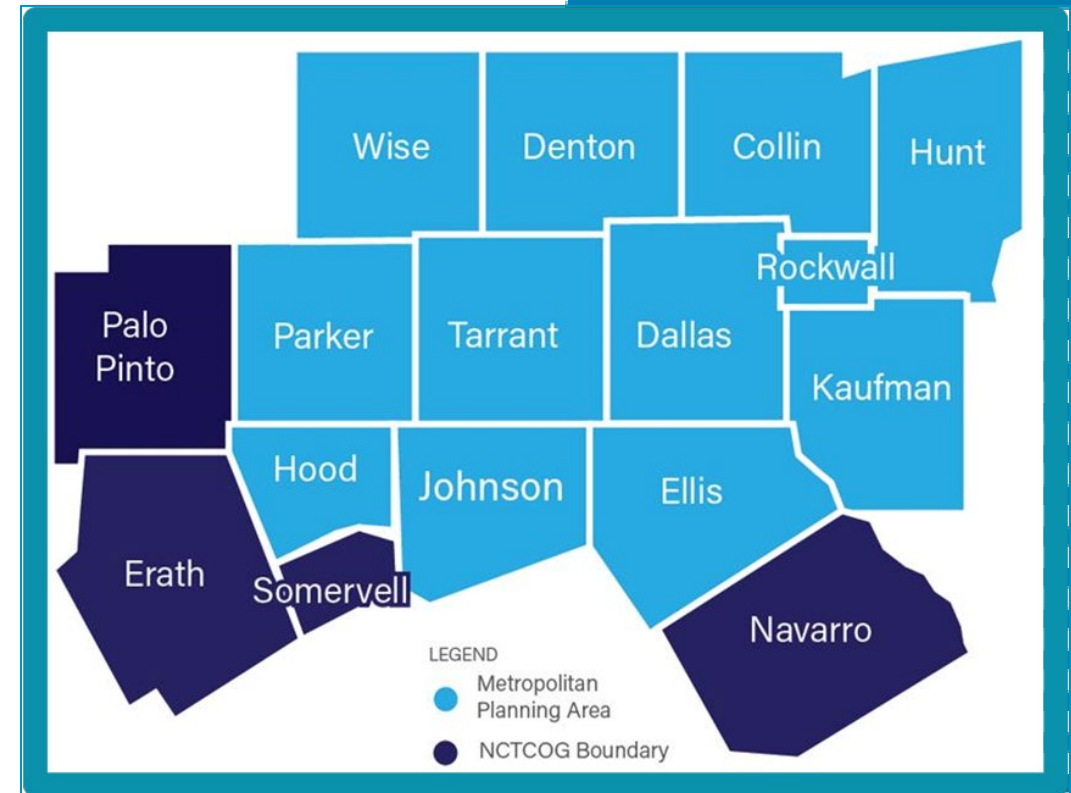
WHY NCTCOG PROCURED INRIX SIGNAL ANALYTICS

- Provide regional performance tool.

- Provide actionable metrics: delay, arrivals on green, split failures.

- Prioritize retiming and congestion mitigation projects.

- Support multi-agency corridor coordination.

- Replace manual travel time runs.

- Support grant applications and collaboration.

NCTCOG Region Traffic Signals
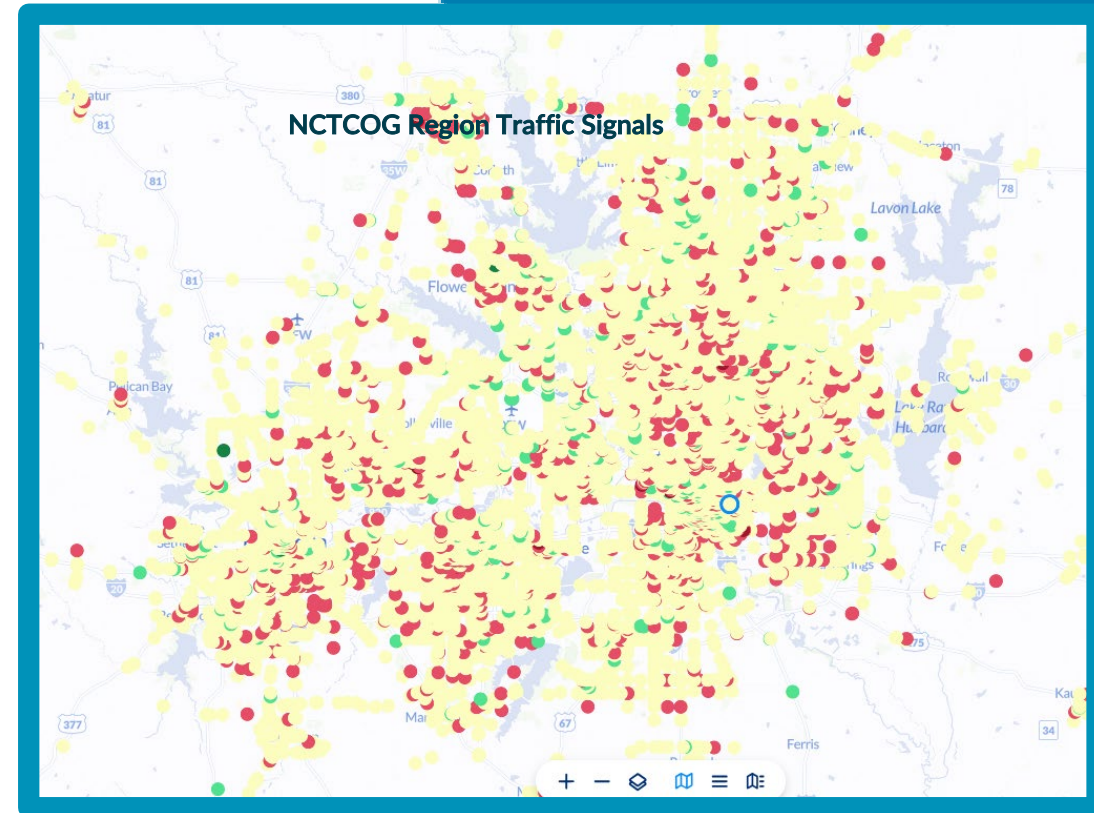
INRIX SIGNAL ANALYTICS

- Cloud-based platform using connected vehicle probe data.

- Provides corridor- and intersection-level performance metrics.

- Key metrics: delay, travel time reliability, arrivals on green.

- Supports regional corridor analysis and proactive operations.
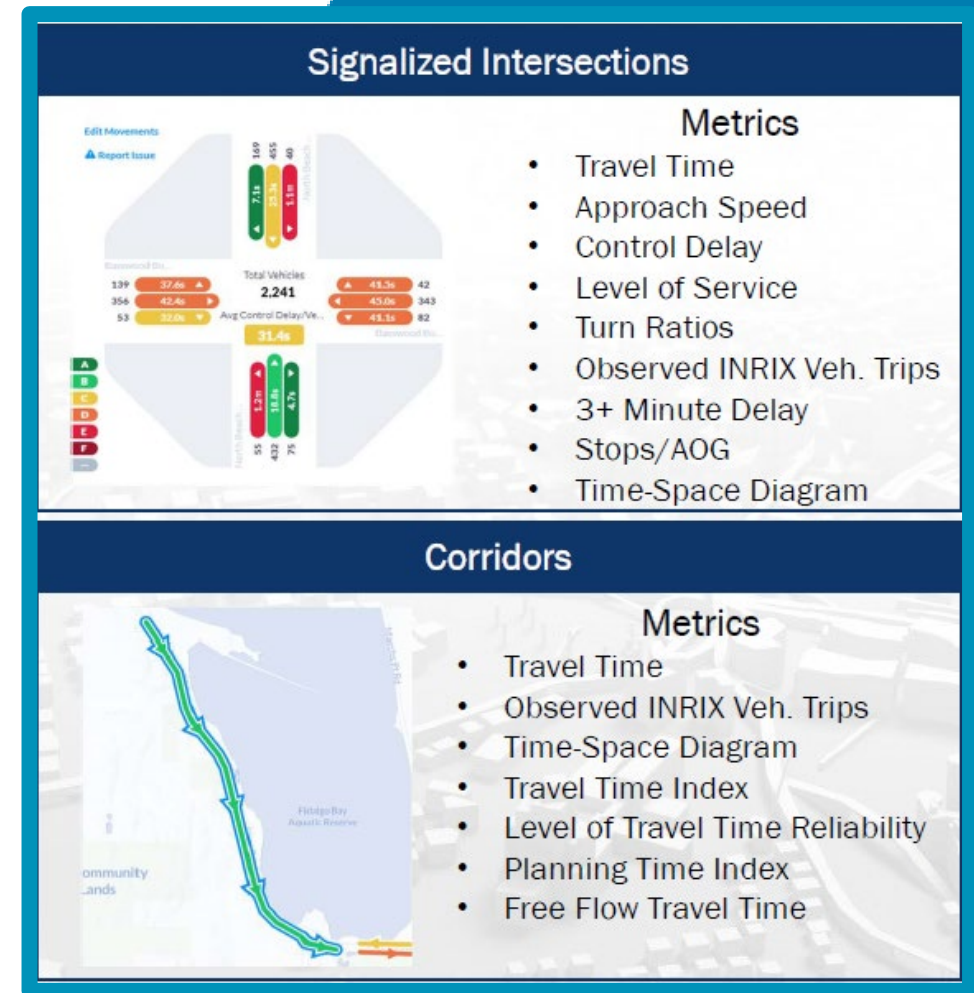
NCTCOG REGIONAL INRIX LICENSE

- One regional license covers all 60+ signal agencies.

- Agencies can create and manage their own corridors.

- NCTCOG can create cross-jurisdictional corridors for regional monitoring.

- Agencies can track performance before and after improvements.

- Consultants can be granted temporary access.

- Includes to RITIS Intersection Matrix.

- Promotes regional data equity and consistency.
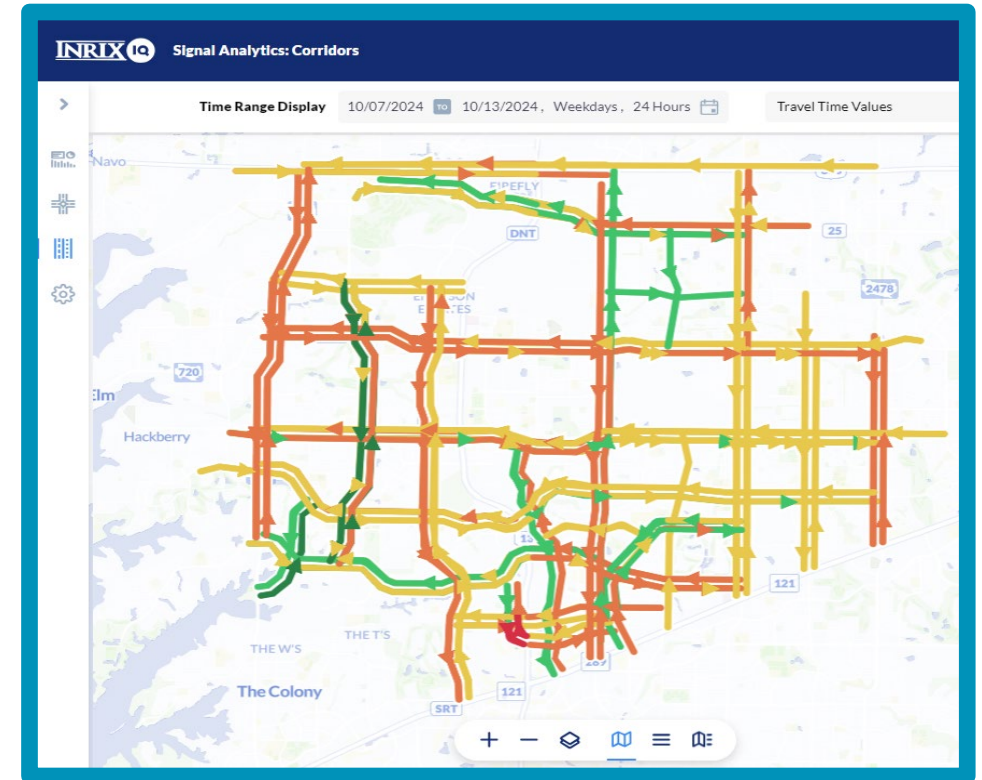
Source: City of Frisco – Frisco corridors on INRIX Platform

FROM REACTIVE TO PROACTIVE

SIGNAL PERFORMANCE MEASURES = PROACTIVE SYSTEM MANAGEMENT

- Understand system-wide performance.

- Identify normal vs. abnormal operations.

- Detect meaningful events/trends early.

- Improve programming and investment decisions.

This aligns directly with our TSMO goals, whereby system-wide issues are detected and addressed before they affect the public.

CASE USE 1: CORRIDOR SELECTION

BEFORE INRIX

- Relied on volumes and air quality estimates.

- Projects submitted by agencies only.

- Regional funding split.

- Limited visibility into actual corridor performance.

NOW WITH INRIX

- Proactively monitor regional corridors, including those that span multiple agencies.

- Uses Delay per Mile and Travel Time Reliability to identify corridors needing retiming.

- Differentiate between retiming needs vs. capacity constraints.

CASE USE #2: INTERSECTION-LEVEL INSIGHTS

- No manual counts required

- Approach-level delay and turn movements estimates.

- Identifies operational issues:
  - High left-turn share – may need protected phasing/storage.
  - High right-turn share – evaluate channelization.

- Combine with crash data for safety reviews.

CASE #3: PROACTIVE MAINTENANCE

EXAMPLE: LEGACY DR. & LAKEHILL BLVD

- **Day 0:** INRIX flags abnormal delay - broken radar panel identified.

- **Day 3–4:** ATMS system detected the problem, but later.

- **Day 7:** Public complaint arrives.

Outcome: Problem resolved a week earlier, minimizing congestion.

Worsened Control Delay (Total)	4-wk Avg	2024-10-08	Change	
1	6593 - COIT ROAD & PGA/VIRGINIA PARKWAY	14.8h C	17.7h C	+2.8h	+19%
2	Lakehill Boulevard & Legacy Drive	5.5h A	8.3h B	+2.8h	+50%
3	Dallas Parkway & Gaylord Parkway	12.7h C	14.9h D	+2.2h	+18%
4	Lebanon Road & Hillcrest Road	10.5h C	12.4h C	+2.0h	+19%
5	Main Street & South County Road	7.0h C	8.4h C	+1.4h	+21%

Worsened Control Delay (per Vehicle)	4-wk Avg	2024-10-08	Change	
1	6593 - COIT ROAD & PGA/VIRGINIA PARKWAY	29s C	34s C	+5s	+19%
2	Lebanon Road & Hillcrest Road	29s C	35s C	+5s	+19%
3	Dallas Parkway & Gaylord Parkway	30s C	35s D	+5s	+18%
4	Main Street & South County Road	25s C	30s C	+5s	+21%
	Lakehill Boulevard & Legacy Drive	7s A	10s B	+3s	+50%

LIMITATIONS OF INRIX SIGNAL ANALYTICS

- Lower accuracy in rural or low-volume areas.

- Tracking gaps for some connected vehicles.

- Close spaced signals may lack robust data.

- 3-minute delay metric may not capture all split failures.
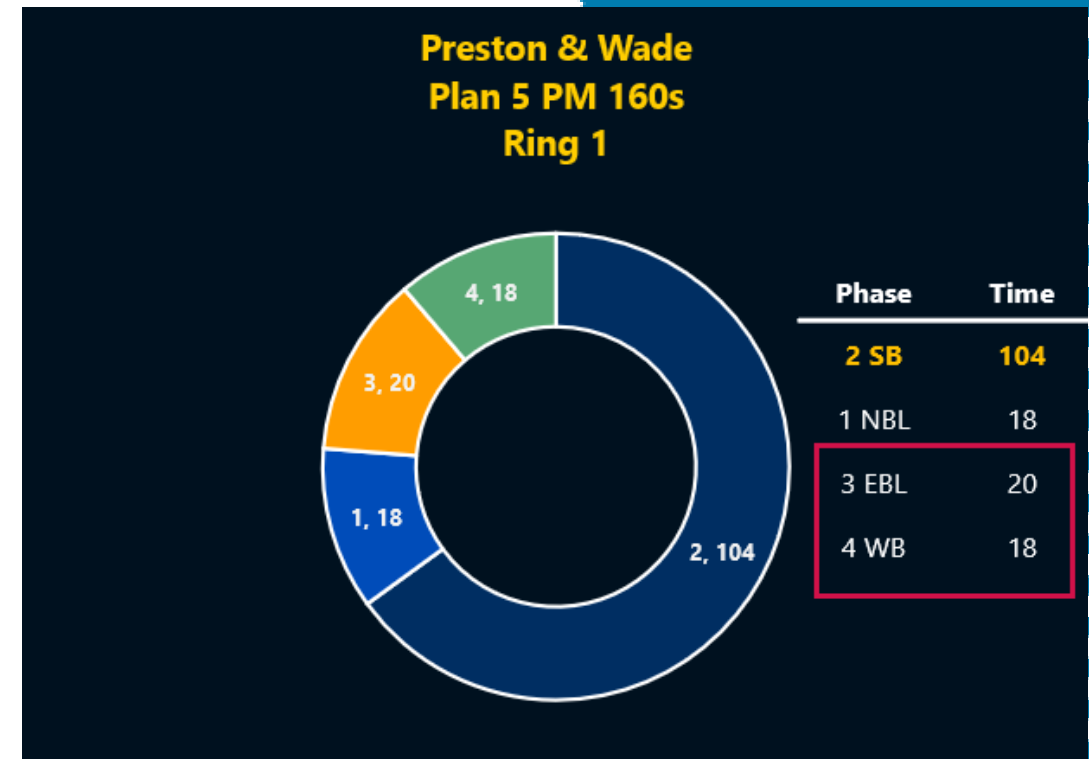
Source: Kirk Houser, Senior Traffic Engineer, City of Frisco

NEXT STEPS & FUTURE ENHANCEMENTS

- Expand corridor and intersection coverage.

- Integrate INRIX and ATSPM where feasible.

- Explore use in safety analysis (crash-prone intersections).

- Support equity-driven corridor studies (underserved communities).

- Continue supporting regional CMAQ and grant applications.

Signal Operations with Connected Vehicle Data

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